

**BEFORE THE PUBLIC UTILITIES COMMISSION OF THE  
STATE OF CALIFORNIA**



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Order Instituting Rulemaking to Oversee the  
Resource Adequacy Program, Consider  
Program Refinements, and Establish Annual  
Local and Flexible Procurement Obligations  
for the 2016 and 2017 Compliance Years.

Rulemaking 14-10-010  
(Filed October 16, 2014)

**COMMENTS OF CALPINE CORPORATION ON DURABLE  
FLEXIBLE CAPACITY REQUIREMENTS**

Matthew Barmack  
Director, Market and Regulatory Analysis  
CALPINE CORPORATION  
4160 Dublin Blvd.  
Dublin, CA 94568  
Tel. (925) 557-2267  
Email: [barmackm@calpine.com](mailto:barmackm@calpine.com)

Patrick Ferguson  
Katie Jorrie  
DAVIS WRIGHT TREMAINE LLP  
505 Montgomery Street, Suite 800  
San Francisco, CA 94111-6533  
Tel. (415) 276-6500  
Fax. (415) 276-6599  
Email: [patrickferguson@dwt.com](mailto:patrickferguson@dwt.com)  
Email: [katiejorrie@dwt.com](mailto:katiejorrie@dwt.com)

Attorneys for Calpine Corporation

September 23, 2016

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Pursuant to the *Assigned Commissioner and Administrative Law Judge’s Phase 3 Scoping Memo and Ruling* (“Scoping Ruling”), Calpine Corporation (“Calpine”) submits the following comments. Calpine appreciates the opportunity to provide comments on the guiding questions set forth in the Scoping Ruling with respect to the California Public Utilities Commission’s (“Commission”) durable flexible capacity requirements (“FCR”) program.

As expressed in previous comments in this proceeding, Calpine believes that the current FCRs have been ineffective because they have neither changed RA procurement nor provided additional compensation for flexible resources.<sup>1</sup> In particular, Calpine has been concerned that the current FCRs have led to reliance on resources to provide flexible RA capacity that may not be able to satisfy operational requirements in real time because they must be committed far in advance of real time.

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<sup>1</sup> See e.g., Comments of Calpine Corporation on Resource Adequacy Track 2 Questions, filed February 5, 2016.

In its 2015 Annual Report on Market Issues and Performance, the California Independent System Operator's ("CAISO") Department of Market Monitoring ("DMM") expressed its agreement with Calpine's concern regarding the potential for real-time reliability issues associated with the current FCRs:

Total procured flexible capacity from extra-long-start resources ranged from about 1,500 MW to 1,770 MW each month. Total procured flexible capacity from long-start resources ranged from about 3,500 MW to 5,500 MW each month. DMM is concerned that this procurement trend could lead to issues in real time if this capacity is not committed before the real-time market.<sup>2</sup>

To be useful, FCRs must be modified to ensure the availability of resources that can actually provide the CAISO with operational flexibility.

While Calpine looks forward to working with other stakeholders on modified FCRs, Calpine is concerned that even modified FCRs may not be effective. Below, Calpine explains the main concerns it has with the continued use of FCRs. Calpine also proposes that Commission Staff and stakeholders focus on energy and ancillary services ("AS") markets as a way of encouraging operational flexibility, and suggests a study to assess the extent to which energy and AS markets compensate the value provided by specific operationally flexible resources.

#### **A. Calpine's General Concerns About FCRs**

Calpine has three main concerns about the continued use of FCRs, even in a modified form. *First*, it is difficult to tie FCRs to clear reliability standards. For example, in the absence of a fleet that can ramp sufficiently quickly, the CAISO can manage reliability by limiting

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<sup>2</sup> CAISO 2015 Annual Report on Market Issues and Performance, at 221 (emphasis added); available at: <http://www.caiso.com/Documents/2015AnnualReportonMarketIssuesandPerformance.pdf>

ramps, perhaps by keeping inflexible units on-line and curtailing renewables. While this outcome may be undesirable from a policy perspective, the opposite extreme (i.e. procuring sufficient flexible resources to obviate the need for any curtailment) may be equally undesirable. Because the trade-off between cost and flexibility is inherently economic, decisions about the amount of flexible resources to procure should be economic and not tethered to specific reliability-related targets in the same manner as system and local requirements. Load serving entities (“LSEs”) might also tolerate different levels of renewable curtailment, so it may not be necessary or desirable to impose a uniform flexible capacity requirement on all LSEs similar to system and local RA requirements.

*Second*, depending on how FCRs are structured, they may not effectively link the provision of flexible RA capacity and the provision of operational flexibility in the operational time frame. For example, the CAISO’s market optimization may not commit a resource when: (a) it is not economic to do so; or (b) the condition that it might be economic to address is unforeseen in the unit commitment time frame. When a resource is not committed, that resource might not be available to meet operational flexibility requirements in real time even if it is complying with the flexible RA must-offer obligation. This issue may be partially addressed by giving greater preference to resources with shorter start times in FCRs, but it still may be difficult to capture fully the complex interplay between different operating characteristics and economics with respect to the provision of operational flexibility in the operational time frame.

*Third*, our collective understanding of operational flexibility requirements continues to evolve. One illustration of this evolution is the CAISO’s changing characterizations of flexibility requirements. Yet capacity products are generally procured on a forward basis, and it is difficult to structure forward procurement based on changing product definitions.

Consequently, it might make sense to keep capacity products comparatively simple, while relying on energy and AS markets to fine tune operational flexibility requirements. Relying on the energy and AS markets would still impact capacity procurement because of the relationship between energy and AS markets and capacity procurement—when the energy and AS markets reward certain operating characteristics, resources with those characteristics need to recover a smaller fraction of their costs from capacity payments and hence become lower cost and more competitive capacity resources.

The Commission has been reluctant to implement multi-year forward RA capacity procurement requirements based on potentially unstable FCRs. Calpine strongly supports multi-year forward RA capacity procurement requirements and hopes that the inability to define “durable” FCRs does not continue to delay further consideration of multi-year forward RA capacity procurement requirements.

### **B. Calpine’s Proposed Study of Combustion Turbines**

While Calpine is interested in continuing to explore modified FCRs, it believes an approach to encouraging operational flexibility that relies more on energy and AS markets also should be explored. Energy and AS markets reflect actual real-time needs and provide compensation for actual performance. Further, energy and AS markets are amenable to changes in operational flexibility requirements because: (1) they inherently reflect such requirements, (*e.g.*, if more regulation is needed, regulation prices increase); and (2) if necessary, it is comparatively easy to change energy and AS market rules without upsetting existing contracts. To better understand the extent to which energy and AS markets might encourage operational

flexibility, Calpine recommends an analysis of combustion turbines (“CTs”).<sup>3</sup> CTs are the most flexible type of conventional generation, but they are also among the most economically challenged. Nevertheless, the CAISO seems to dispatch CTs frequently as part of its optimization, sometimes starting them multiple times per day.<sup>4</sup>

The CT study Calpine proposes would explore the extent to which the operation of CTs reduces the wholesale costs paid by load through both clearing prices and uplift payments. It would then attempt to assess whether there is a gap between the wholesale cost savings provided by CTs and their compensation. Specifically, Calpine proposes comparing the results of multiple production cost simulations (or simulations using the CAISO’s full market software)—one with the existing generating fleet and another with some volume of CTs removed from the simulation.<sup>5</sup> Comparing these simulations should demonstrate the extent to which the wholesale cost savings provided by CTs might fall short of what they are actually compensated. To the extent a gap is identified, it might illustrate the scale of additional capacity payments for resources with certain operating characteristics that might be cost-effective or inform changes to CAISO energy and AS markets to close the gap.

Other studies have already suggested that there might be a gap between wholesale market compensation and value for certain types of flexible resources. For example, a recent NREL

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<sup>3</sup> Calpine believes its study proposal is most closely related to Guiding Question 4 from the Scoping Ruling. *See* Scoping Ruling, at 4 (“What, if any, characteristics of flexibility are not currently supplied appropriately through the FCR program, other procurement programs, or CAISO energy and ancillary services markets?”)

<sup>4</sup> *See e.g.*, CAISO Workshop Comments of Cogentrix Energy Power Management, LLC on Southern California Electricity Infrastructure Reliability, filed September 12, 2016; available at [http://docketpublic.energy.ca.gov/PublicDocuments/16-IEPR-06/TN213628\\_20160912T162731\\_Greg\\_Blue\\_Comments\\_IEPR\\_20160829\\_Workshop\\_Comments.pdf](http://docketpublic.energy.ca.gov/PublicDocuments/16-IEPR-06/TN213628_20160912T162731_Greg_Blue_Comments_IEPR_20160829_Workshop_Comments.pdf)

<sup>5</sup> Note that it may be necessary to add back inflexible capacity so the two simulations are based on the same level of capacity surplus.

study indicated that the value provided by energy storage may exceed its market value.<sup>6</sup> One possible explanation for this gap is that some of the value provided by storage involves avoided start costs, which are not necessarily reflected in clearing prices for energy and AS. Relatedly, a study by Wartsila, a vendor of peaking plants utilizing internal combustion engine technology, demonstrated how swapping plants based on their technology for some other new generation might reduce wholesale procurement costs for load.<sup>7</sup> However, the Wartsila study did not attempt to assess how those savings might compare to what the plants might earn from wholesale markets.

Understanding the extent to which energy and AS markets reward particular flexible resources, CTs, would provide valuable insight into how the entire suite of markets including energy, AS, and RA markets reward flexible resources and how they might be modified to better align compensation and value.

Respectfully submitted,

/s/

Matthew Barmack  
Director, Market and Regulatory Analysis  
CALPINE CORPORATION  
4160 Dublin Blvd.  
Dublin, CA 94568  
Tel. (925) 557-2267  
Email: [barmackm@calpine.com](mailto:barmackm@calpine.com)

Patrick Ferguson  
Katie Jorrie  
DAVIS WRIGHT TREMAINE LLP  
505 Montgomery Street, Suite 800  
San Francisco, CA 94111-6533  
Tel. (415) 276-6500  
Fax. (415) 276-6599  
Email: [patrickferguson@dwt.com](mailto:patrickferguson@dwt.com)  
Email: [katiejorrie@dwt.com](mailto:katiejorrie@dwt.com)

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Attorneys for Calpine Corporation

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<sup>6</sup> See Operational Benefits of Meeting California's energy Storage Targets, December 2015; available at <http://www.nrel.gov/docs/fy16osti/65061.pdf>

<sup>7</sup> See Power System Optimization By Increased Flexibility; available at: <http://cdn.wartsila.com/docs/default-source/Power-Plants-documents/downloads/White-papers/americas/Power-System-Optimization-by-Increased-Flexibility.pdf?sfvrsn=4>